

## Appendix C

# OH-58D Systems

### SECTION I—SYSTEMS DISCUSSION

#### CREW INTERFACE

C-1. The crew interfaces with a fully integrated glass cockpit. Master controller processor units correlate individual system information before displaying it on the MFDs. The crew can select various displays, referred to as pages, on the MFDs. The primary pages available are vertical situation, horizontal situation, MMS, communication, and weapons. The system also has a series of pages known as built-in test and fault detection and location for maintenance purposes.

#### DATA TRANSFER SYSTEM

C-2. The DTS consists of a ground station, data transfer module, and data transfer receptacle in the aircraft. Before a flight, the AMPS can load up to three separate sets of mission data. The AMPS can be upgraded to enhance its capabilities to send and receive SPOT/SITUATION reports and still picture video (VIXL) directly from the aircraft to the AMPS via the SINCGARS radio and the TCIM. During the flight, the operator can store data in the data transfer module. After the flight, the ground station can retrieve the data. Data include mission identification, waypoints, targets, flight plans, battlefield graphic, radio frequencies/settings, and IFF. The module also has a limited flight data recorder function that can be useful in incident/accident investigations.

#### VIDEO TAPE RECORDER

C-3. The VTR is an 8-millimeter system and will record the page selected on the left multifunction display and all cockpit audio. It records for a maximum of two hours per tape. The crew can review the video recording in the cockpit. On completion of the mission, commanders, staff, and intelligence personnel can use the video recording for a detailed analysis. This VTR is extremely useful in reconnaissance and security operations. It is also a useful training aid for mission debriefings.

#### ANVIS DISPLAY SYMBOLOGY SYSTEM

C-4. The ADSS consists of a small, lightweight ODA and an electronics interface. The ODA mounts directly to the AN/AVS-6 NVD. The ADSS provides basic flight information to include vertical situation, airspeed, barometric and radar altitudes, headings, torque, MMS orientation, and waypoint direction. This allows the crew to maintain outside orientation without being forced to scan inside the cockpit for basic flight instruments.

## **MAST-MOUNTED SIGHT**

C-5. The MMS is used only for targeting, not for flying the aircraft. The MMS sensors are approximately 6 feet above the pilot's eyes. This allows the crew to view an area while keeping the aircraft masked. The MMS houses the TIS, TVS, LRF/D, and optical boresight assembly. Camouflage, ambient weather, age and/or condition of sensors, and the type of terrain are major factors that affect MMS range capabilities.

## **THERMAL IMAGING SENSOR**

C-6. Like a FLIR, the TIS sees IR energy (heat) and can detect radiation differences of less than 2 degrees Celsius. The output is displayed on the MFD as a monochromatic green picture when the MMS TIS page is selected.

## **TELEVISION SENSOR**

C-7. The TVS picture displayed in the cockpit is monochromatic green; the crew cannot distinguish colors. The TVS is generally a day-only sensor. However, because of its low light level capabilities, the TVS can be used at night to look into areas with artificial illumination. For example, the TVS can effectively look inside a lighted aircraft hangar at night. This capability should not be confused with the light amplification capabilities of NVG. The TVS can see through light obscurants, such as haze, but not into thick smoke as with the TIS.

## **LASER RANGE FINDER/DESIGNATOR**

C-8. The laser performs four basic functions—ranging, navigation update, target position location, and designation. It is hazardous to vision out to a range of 23 kilometers.

## **VIDEO IMAGE CROSS LINK**

C-9. Some KW aircraft may have the capability to send real-time video or still frames of captured video, to a remote station such as AMPS. Free text data can be added to this image to explain or enhance the displayed information. Each image will be time stamped via EGI clock.

## **WEAPON CONFIGURATIONS**

C-10. The KW has two universal weapon pylons, one on each side. The four primary weapon systems are the .50-caliber machine gun, 70-millimeter rockets, and the Hellfire and Stinger missiles. The .50-caliber machine gun can only be installed on the left side of the KW. The other weapon systems can be mounted on either or both pylons. Weapon mixes are extremely flexible to accommodate METT-T (Figure C-1).

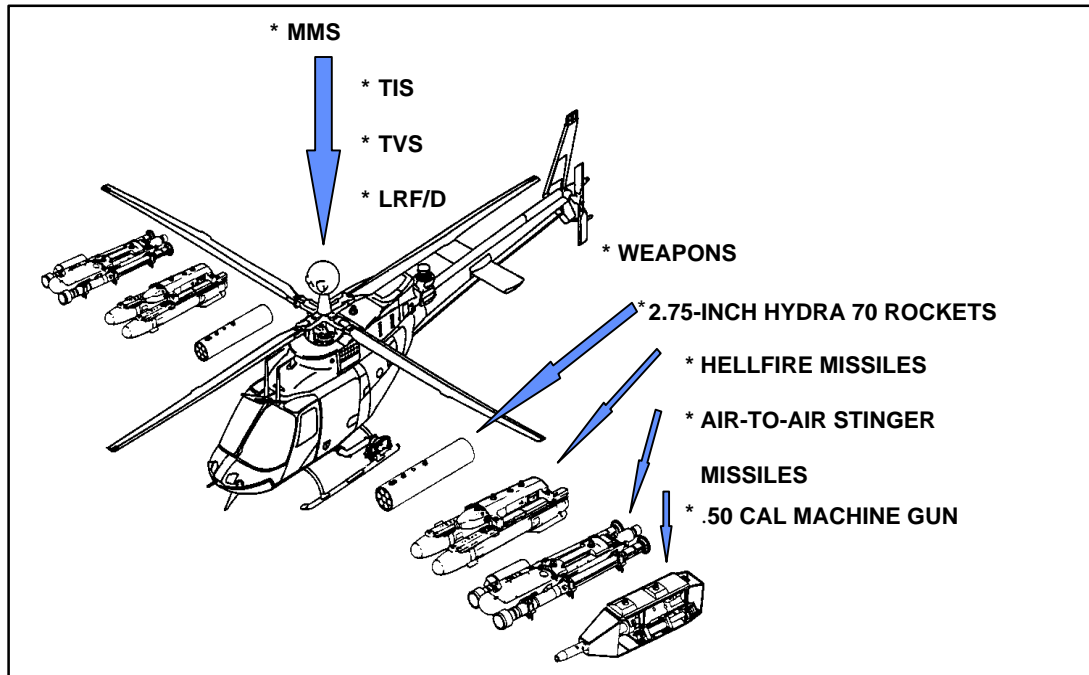


Figure C-1. Weapon Mixes (One Weapon System Per Side)

### **.50-CALIBER MACHINE GUN**

C-11. The .50-caliber machine gun uses standard military linked .50-caliber ammunition. Its maximum effective range is 2,000 meters. The basic load of .50-caliber ammunition is 500 rounds. Some aircraft are equipped with an AIM-1 laser for targeting. The AIM-1 laser is very small self-contained IR laser mounted on the gun that is visible only with NVGs out to a range of about 1000 meters depending on illumination.

### **2.75-INCH ROCKETS**

C-12. The KW can carry one or two rocket pods, for a maximum of 14 rockets. The three primary warheads used are high-explosive, flechettes, and multipurpose submunitions. The pilot can aim the rockets either through the multifunction display or heads-up display.

### **AIR-TO-AIR STINGERS**

C-13. The KW can carry two ATAS missiles on either pylon, for a maximum of four missiles. The ATAS has a minimum arming range of less than 1,000 meters and a maximum range in excess of 5 kilometers. The pilot can lock onto a target with either the pilot display unit, which is a heads-up sight, or through the ATAS page on the pilot's MFD.

### **HELLFIRE MISSILES**

C-14. The Hellfire is a laser-guided, point-detonating missile. The KW can carry two of these missiles on each pylon, for a maximum of four missiles. The crew guides the missile using laser energy. The minimum engagement

range is 500 meters, and the maximum range is 8,000 meters, depending on missile model launch modes.

## **COMMUNICATIONS**

C-15. The KW has two FM radios, one UHF radio, and one VHF radio. Provisions for an AN/ARC-199 or AN/ARC-220 HF radio with TSEC/KY-75 or TSEC/KY-100 are in place; however, HF radios are not installed in most KWs. The KW has two TSEC/KY-58s; one is dedicated to the FM 1 radio, and the other can be used for the UHF, VHF, or FM 2 radio. A planned upgrade to the FM SINCGARS radio will contain an embedded KY-58 that will allow the remaining KY-58s to be used for the UHF and VHF radios. The crew can switch between the UHF, VHF, and FM 2 radios in the secure mode anytime during flight. The UHF is Have Quick II capable. The SINCGARS FM radios are FH capable.

## **AIRBORNE TARGET HANDOVER SYSTEM**

C-16. The ATHS transmits digital data to users via secure or unsecure existing radio links. It can communicate with artillery TACFIRE and BCS nets and will be compatible with the Air Force improved data modem. It has preformatted reports, such as SIT/STAT, SPOT, Artillery, BDA, and CAS, and requests for reports. Target location information from the MMS and navigation systems is automatically placed in the ATHS for target handovers and reports.

## **RETRANSMISSION**

C-17. Retransmission can be accomplished with FM or HF radios. For example, the crew can receive on FM-1 and retransmit automatically on HF or FM-2.

## **NAVIGATION**

C-18. EGI uses GPS signals to provide accurate position reporting. The system can operate on UTM grid or latitudinal and longitudinal coordinates.

## **AIRCRAFT SURVIVABILITY EQUIPMENT**

C-19. The KW has an integrated ASE suite. It includes the AN/ALQ-144, AN/APR-39, AN/AVR-2, and AN/APX-100.

### **AN/ALQ-144**

C-20. The AN/ALQ-144 is an IR missile jammer. It sends out an IR signal that confuses the guidance system on hostile IR-seeking missiles.

### **AN/APR-39**

C-21. The AN/APR-39 is a radar warning system. The KW can be equipped with either the AN/APR-39 or the AN/APR-39A(V1). The A version has an improved display and expanded processing capabilities.

**AN/AVR-2**

C-22. The AN/AVR-2 is a laser detection set. It provides a laser warning to the crew through the AN/APR-39 display. If the aircraft is being lased, the crew also receives a caution message and an audio tone.

**AN/APX-100**

C-23. The AN/APX-100 transponder has Modes 1, 2, 3(A/C), and 4. The crew can change transponder information through the COMM page on the multifunction display.

**SECTION II—GENERAL INFORMATION****DEPLOYABILITY**

C-24. Because of its rapid deployment capability, the KW can be quickly integrated into armed conflict. This aircraft can be unloaded from all USAF transport aircraft (C-130 to C-5) and operational in 15 minutes. Unloading and reassembly can be done on a blacked-out dirt airstrip at night. When loading for high density lifts the tailboom must be removed from the KWs, reassembly under these circumstances will take considerably longer.

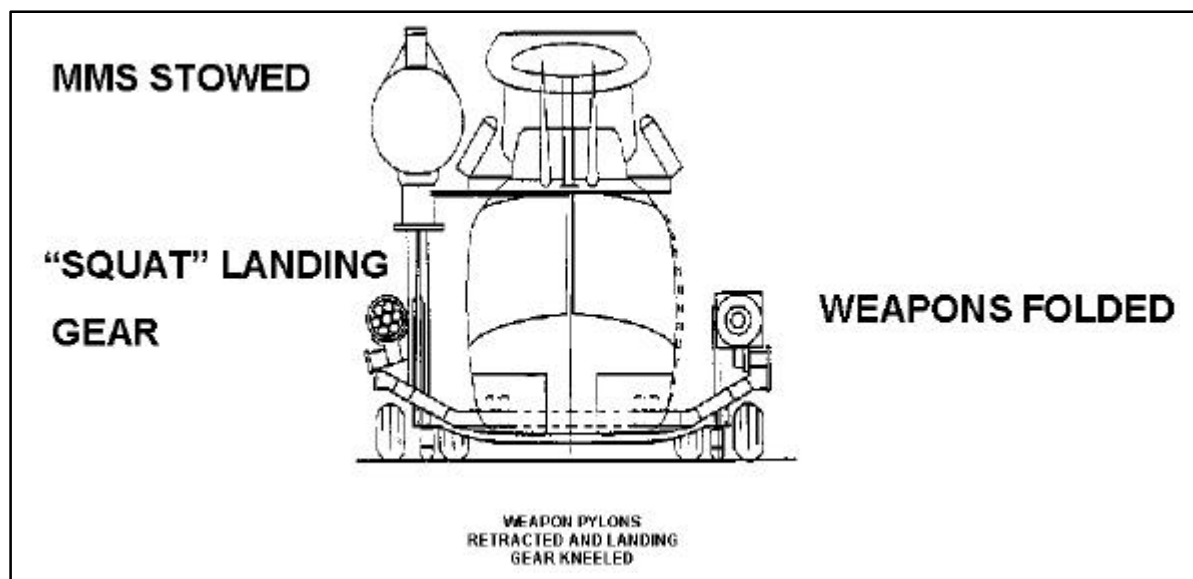


Figure C-2. OH-58D with Deployable Landing Gear

**AVIATION MISSION PLANNING SYSTEM**

C-25. The AMPS is a planning and/or battle synchronization tool that automates aviation mission planning tasks. The mission planner uses the AMPS to develop a mission through a logical progressive sequence of operations. These sequences of operations aid the mission planner in

preparing essential tasks. Upon the completion of the mission plan, the mission planner initiates a transfer of the premission data to the DTS that downloads the data to the DTC. The DTC is removed from the DTS and transported to the aircraft where the information is downloaded into the aircraft's systems. Upon completion of the mission, the DTC is transported back to the AMPS and inserted into the DTS. This allows the postmission data obtained during the flight to be transferred into the AMPS for mission analysis.

## **LASER GUIDED MUNITIONS**

### **COPPERHEAD ARTILLERY PROJECTILES**

C-26. The KW may be the most effective target lasing system for the cannon launched guided projectile (Copperhead) because of the MMS and the aircraft's maneuverability. Copperhead ranges are 3 to 16.1 kilometers from the gun tube. The KW crew can designate moving or stationary targets out to 10 kilometers. Designation ranges depend on the type of target, ambient conditions, and MMS performance. The maximum separation angle from the gun-target line is 45 degrees.

### **LASER GUIDED BOMBS**

C-27. The USAF, USN, and USMC all employ laser-guided bombs. Because the laser code for these munitions are set on the ground prior to take off, the designator will be required to change his code to match that of the bomb. Therefore, greater coordination and longer lasing times are necessary. The CAS aircraft may ask for a laser spot to verify the target prior to dropping bombs. The spot is detectable by CAS aircraft to 20 km. The CAS aircraft will also generally call for spot on based on altitude and range to the target to ensure final guidance of the munition.